

REMARKS

Receipt of the final office action mailed September 10, 2004, is acknowledged. Applicant has carefully reviewed and considered the office action and the references cited therein.

Entry of this amendment under Rule 116 is respectfully requested as the amendment to claim 1 raises no issues and does not warrant any further searching. The total number of claims has not been increased.

Claims 1 and 9 have been amended. Claims 1-4, 6-7 and 9-10 are pending. Claims 9 and 10 are indicated as being allowable. Therefore, only six claims are at issue here: 1-4 and 6-7.

Claims 1, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Ries" (US 2002/0127766A1) in view of "Downey" (US 6,087,247) and further in view of "Raajimakers" (US 2002/0052124). Applicants respectfully submit that this rejection is improper for the following reasons.

At the outset, under MPEP §§ 2142 and 2143,

[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.

Citing, In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991);
see also MPEP § 2143-§ 2143.03 for decisions pertinent to each of these criteria. No

combination of Ries, Downey and Raajimakers discloses all of the elements of independent claim 1 and therefore no *prima facie* of obviousness has been established.

Ries discloses that the epitaxial silicon layer is grown on the etched front surface of the semiconductor wafer to improve the surface roughness of the front surface of the semiconductor wafer. See the Ries abstract and paragraph 0017.

In contrast, amended claim 1 recites that the ion implantation layer is formed *in a well* by means of an ion implantation process. Forming the ion implantation layer in a well controls the threshold voltage of a transistor. Therefore, Ries does not disclose that the ion implantation layer is formed *in a well* by means of the ion implantation process. Instead, Ries merely discloses forming the ion implantation layer on an etched front surface of a substrate.

Further, in Ries, the post-epitaxial cleaning techniques are carried out to form a silicon oxide layer on the epitaxial surface which passivates the surface. See Fig. 1 and paragraphs 0023 and 0024 of Ries. Thus, the Ries post-epitaxial cleaning techniques are not carried out to control the impurity concentration of the ion implantation layer after performing the ion implantation process as recited in amended claim 1. Therefore, Ries does not disclose the concept that the impurity concentration of the ion implantation layer is controlled by means of the cleaning process as recited in amended claim 1.

Downey is only cited for the proposition that an oxide layer can be used to control the out-diffusion of boron. Downey is not cited for, nor does Downey disclose the concepts of (1) forming an ion implantation layer in a well or (2) controlling the impurity concentration with a cleaning process as required by claim 1. As established above, neither does Ries.

Raajimakers is only cited for the proposition that it discloses a SC1/HF bath. However, Raajimakers in no way suggests that such a bath could be used to control impurity concentrations. Raajimakers is also silent on forming an implantation layer in a well. As noted above, neither does Ries or Downey.

Therefore, claims 1, 6 and 7 are clearly patentable over Ries, Downey, and Raajimakers as no combination of these three references teaches or suggests all of the elements of amended claim 1. Therefore, the obviousness rejection of claims 1, 6 and 7 based upon Ries, Downey and Raajimakers is improper under Sections 2142 and 2143 and should be withdrawn.

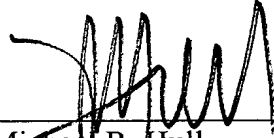
Next, claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ries, Downey and Raajimakers as applied to claim 1 above, and further in view of the excerpt from the article by "Wolf," which is already of record.

Claims 2-4 depend from claim 1. Wolf is only cited for the proposition that it discloses the energy ranges cited in claim 2. Wolf is not cited for the proposition that it discloses forming an ion implantation layer in a well or controlling the impurity concentration with a cleaning process as required by claim 1. As established above, neither does Ries, Downey or Raajimakers. Accordingly, Applicants respectfully submit that the obviousness rejection of claims 2-4 based upon Ries, Downey, Raajimakers and Wolf is improper and should be withdrawn.

In summary, Applicant believes that the claims 1 and 9 are patentable over the cited references and that claims 2-4, 6-7 and 10 depending on the allowable base claims 1 and 9 are also in condition for allowance. Applicant respectfully requests that the Examiner pass this case to issue. The Examiner is invited to contact the undersigned at

the telephone number listed below in order to discuss any remaining issues or matters of form that will place this case in condition for allowance.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Michael R. Hull', written over a horizontal line.

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